

Abstract

This invention relates to methodologies and techniques that utilize programmable functionalized self-assembling nucleic acids, nucleic acid modified structures, and other selective affinity or binding moieties as building blocks for creating molecular electronic and photonic mechanisms; organizing, assembling, and interconnecting nanostructures, submicron- and micron-sized components onto silicon or other materials; organizing, assembling, and interconnecting nanostructures, submicron- and micron-sized components within perimeters of microelectronic or optoelectronic components/devices; and creating and manufacturing photonic and electronic structures, devices, and systems. In one aspect of this invention, a method for forming a multiple identity substrate material is provided comprising the steps of: providing a first affinity sequence at multiple locations on a support, providing a functionalized second affinity sequence, which reacts with the first affinity sequence, and has an unhybridized overhang sequence, and selectively cross-linking first affinity sequences and second affinity sequences.